WE CLAIM:

1. A composition comprising:

an electron donor comprising an arylsulfinate salt having a anion of Formula I

$$Ar^1—SO_2^-$$

I

and a cation having at least one carbon atom and either a positively charged nitrogen atom or a positively charged phosphorus atom, said electron donor having an oxidation potential in N,N-dimethylformamide of 0.0 to +0.4 volts versus a silver/silver nitrate reference electrode, wherein Ar^1 is a substituted phenyl, an unsubstituted or substituted C_{7-30} aryl, or an unsubstituted or substituted C_{3-30} heteroaryl, said substituted Ar^1 having a substituent that is an electron withdrawing group or an electron withdrawing group in combination with an electron donating group; and

an electron acceptor having a reduction potential in N,N-dimethylformamide of +0.4 to –1.0 volts versus a silver/silver nitrate reference electrode.

2. The composition of claim 1, wherein the Ar^1 group of the arylsulfinate salt is anthryl, naphthyl, acenaphthyl, phenanthryl, phenanthrenyl, perylenyl, anthracenyl, anthraquinonyl, anthronyl, biphenyl, terphenyl, 9,10-dihydroanthracenyl, or fluorenyl, said Ar^1 group being unsubstituted or substituted with an electron withdrawing group or an electron withdrawing group in combination with an electron donating group.

3. The composition of claim 1, wherein the Ar^1 group of the arylsulfinate salt is quinolinyl, isoquinolinyl, quinazolinyl, quinoxalinyl, cinnolinyl, benzofuranyl, benzomercaptophenyl, benzoxazolyl, benzothiazolyl, benzimidazolyl, indolyl, phthalazinyl, benzothiadiazolyl, benzotriazinyl, phenazinyl, phenanthridinyl, acridinyl, or indazolyl, said Ar^1 group being unsubstituted or substituted with an electron withdrawing group or an electron withdrawing group in combination with an electron donating group.

4. The composition of claim 1, wherein the Ar^1 group of the arylsulfinate salt is a substituted phenyl, an unsubstituted or substituted naphthyl, or an unsubstituted or substituted anthraquinonyl, said substituted Ar^1 having a substituent that is an electron

withdrawing group or an electron withdrawing group in combination with an electron donating group.

5. The composition of claim 1, wherein the Ar^1 group is phenyl substituted with an electron withdrawing group selected from halo, cyano, fluoroalkyl, perfluoroalkyl, carboxy, alkoxycarbonyl, aryloxycarbonyl, halocarbonyl, formyl, carbonyl, sulfo, alkoxysulfonyl, aryloxysulfonyl, perfluoroalkylsulfonyl, alkylsulfonyl, azo, alkenyl, alkynyl, dialkylphosphonato, diarylphosphonato, aminocarbonyl, or combinations thereof.

6. The composition of claim 1, wherein the anion of the arylsulfinate salt is 4-chlorobenzenesulfinate, 4-cyanobenzenesulfinate, 4-ethoxycarbonylbenzenesulfinate, 4-trifluoromethylbenzenesulfinate, 3-trifluoromethylbenzenesulfinate, 1-anthraquinone sulfinate, 1-naphthalenesulfinate, or 2-naphthalenesulfinate.

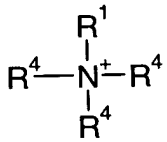
7. The composition of claim 1, wherein the cation of the arylsulfinate salt is ring structure comprising a 4 to 12 member heterocyclic group having a positively charged nitrogen atom, said heterocyclic being saturated or unsaturated and having up to 3 heteroatoms selected from oxygen, sulfur, nitrogen, or combinations thereof, wherein said ring structure is unsubstituted or substituted with a substituent selected from an alkyl, aryl, acyl, alkoxy, aryloxy, halo, mercapto, amino, hydroxy, azo, cyano, carboxy, alkoxycarbonyl, aryloxycarbonyl, halocarbonyl, or combinations thereof.

8. The composition of claim 7, wherein said heterocyclic group is bicyclic.

9. The composition of claim 7, wherein said heterocyclic group is fused to a cyclic or bicyclic group that is saturated or unsaturated and that has 0 to 3 heteroatoms.

10. The composition of claim 7, wherein said heterocyclic group is fused to an aromatic ring having 0 to 3 heteroatoms.

11. The composition of claim 1, wherein the cation of the arylsulfinate salt is of Formula II



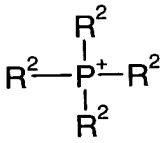
II

where

R^1 is an unsubstituted alkyl, an alkyl substituted with a hydroxy, an unsubstituted aryl, or an aryl substituted with an alkyl, hydroxy, or combinations thereof; and

each R^4 is independently hydrogen, an unsubstituted alkyl, an alkyl substituted with a hydroxy, an unsubstituted aryl, or an aryl substituted with an alkyl, hydroxy or combination thereof.

12. The composition of claim 1, wherein the cation of the arylsulfinate salt is of Formula III



III

where each R^2 is independently an unsubstituted alkyl, an alkyl substituted with a hydroxy, an unsubstituted aryl, or an aryl substituted with an alkyl, hydroxy, or combinations thereof.

13. The composition of claim 1, wherein the cation of the arylsulfinate salt is a tetraalkylammonium ion.

14. The composition of claim 1, wherein the cation of the arylsulfinate salt is a tetrabutylammonium ion.

15. The composition of claim 1, wherein the arylsulfinate salt has an anion that is a benzenesulfinate substituted with an electron withdrawing group electron selected from halo, cyano, fluoroalkyl, perfluoroalkyl, carboxy, alkoxycarbonyl, aryloxycarbonyl, halocarbonyl, formyl, carbonyl, sulfo, alkoxysulfonyl, aryloxysulfonyl,

perfluoroalkylsulfonyl, alkylsulfonyl, azo, alkenyl, alkynyl, dialkylphosphonato, diarylphosphonato, aminocarbonyl, or combinations thereof and the cation is a tetraalkylammonium ion.

16. The composition of claim 1, wherein the electron donor is tetrabutylammonium 4-ethoxycarbonylbenzenesulfinate or tetrabutylammonium 4-cyanobenzenesuflinate.

17. The composition of claim 1, wherein the electron acceptor is an iodonium salt, a hexaarylbisimidizole, a persulfate, a peroxide, or a metal ion in an oxidized state.

18. The composition of claim 1, further comprising a sensitizing compound capable of absorbing a wavelength of actinic radiation in the range of 250 to 1000 nanometer.

19. The composition of claim 18, wherein the electron acceptor is a diaryliodonium salt, a hexaarylbisimidizole, or combinations thereof.

20. The composition of claim 18, wherein the electron acceptor has an electron potential in the range of 0.0 to –1.0 volts versus a silver/silver nitrate reference electrode.

21. The composition of claim 1, further comprising an ethylenically unsaturated monomer.

22. The composition of claim 21, wherein the ethylenically unsaturated monomer comprises a monoacrylate, monomethacrylate, diacrylate, dimethacrylate, polyacrylate, polymethacrylate, or combinations thereof, wherein said monomer is unsubstituted or substituted with a hydroxy.

23. The composition of claim 18, wherein the composition further comprises a hydroxy-containing material selected from an alcohol, a hydroxy-containing monomer, or combinations thereof.

24. A method of photopolymerization comprising irradiating a photopolymerizable composition with actinic radiation until the photopolymerizable composition gels or hardens, said photopolymerizable composition comprising:

an ethylenically unsaturated monomer;

a sensitizing compound capable of absorbing a wavelength of actinic radiation in the range of 250 to 1000 nanometers;

an electron donor having an oxidation potential in N,N-dimethylformamide of 0.0 to +0.4 volts versus a silver/silver nitrate reference electrode, said electron donor comprising an arylsulfinate salt having an anion of Formula I

$$Ar^1—SO_2^-$$

I

and a cation comprising at least one carbon atom and either a positively charged nitrogen atom or a positively charged phosphorus atom, wherein Ar^1 is a substituted phenyl, an unsubstituted or substituted C_{7-30} aryl, or an unsubstituted or substituted C_{3-30} heteroaryl, said substituted Ar^1 having a substituent that is an electron withdrawing group or an electron withdrawing group in combination with an electron donating group; and

an electron acceptor having a reduction potential in N,N-dimethylformamide of +0.4 to −1.0 volts versus a silver/silver nitrate reference electrode, said electron acceptor being colorless when dissolved in an alcohol or the ethylenically unsaturated monomer.

25. The method of claim 24, wherein the anion of the arylsulfinate salt is 4-chlorobenzenesulfinate, 4-cyanobenzenesulfinate, 4-ethoxycarbonylbenzenesulfinate, 4-trifluoromethylbenzenesulfinate, 3-trifluoromethylbenzenesulfinate, 1-anthraquinone sulfinate, 1-naphthalenesulfinate, or 2-naphthalenesulfinate.

26. The method of claim 24, wherein the cation of the arylsulfinate salt is a tetraalkylammonium ion.

27. The method of claim 24, wherein the arylsulfinate salt has an anion that is a benzenesulfinate substituted with an electron withdrawing group electron selected from halo, cyano, fluoroalkyl, perfluoroalkyl, carboxy, alkoxycarbonyl, aryloxycarbonyl,

halocarbonyl, formyl, carbonyl, sulfo, alkoxysulfonyl, aryloxysulfonyl, perfluoroalkylsulfonyl, alkylsulfonyl, azo, alkenyl, alkynyl, dialkylphosphonato, diarylphosphonato, aminocarbonyl, or combinations thereof and the cation is a tetraalkylammonium ion.

28. The method of claim 24, wherein the electron acceptor is an iodonium salt, a hexaarylbisimidizole, or combinations thereof.

29. The method of claim 24, wherein the electron acceptor is a diaryliodonium salt.

30. The method of claim 24, wherein the photopolymerizable composition comprises 0.1 to 4 wt% electron donor, .1 to 4 wt% electron acceptor, and 5 ppm to 4 wt% sensitizing compound based on the weight of the monomer.

31. The method of claim 24, wherein the ethylenically unsaturated monomer comprises a hydroxy-containing monomer.

32. The method of claim 24, wherein the photopolymerizable composition further comprises an alcohol.

33. A method of polymerization comprising:

forming a polymerizable composition comprising

an ethylenically unsaturated monomer;

an electron donor having an oxidation potential in N,N-dimethylformamide of 0.0 to +0.4 volts versus a silver/silver nitrate reference electrode, said electron donor comprising an arylsulfinate salt having an anion of Formula I

$$Ar^1—SO_2^-$$

I

and a cation that contains at least one carbon atom and either a positively charged nitrogen atom or a positively charged phosphorus atom, wherein Ar^1 is a substituted phenyl, an unsubstituted or substituted C_{7-30} aryl, or an unsubstituted or substituted C_{3-30} heteroaryl, said substituted Ar^1 having a substituent that is an electron withdrawing

group or an electron withdrawing group in combination with an electron donating group;

an electron acceptor having a reduction potential in N,N-dimethylformamide of +0.4 to –1.0 volts versus a silver/silver nitrate reference electrode; and

reacting the polymerizable composition.

34. The method of claim 33, wherein the electron acceptor is a persulfate, a peroxide, a metal ion in an oxidized state, or a combination thereof.

35. The method of claim 34, wherein said reacting comprises applying heat.

36. The method of claim 33, wherein the anion of the arylsulfinate salt is 4-chlorobenzenesulfinate, 4-cyanobenzenesulfinate, 4-ethoxycarbonylbenzenesulfinate, 4-trifluoromethylbenzenesulfinate, 3-trifluoromethylbenzenesulfinate, 1-anthraquinone sulfinate, 1-naphthalenesulfinate, or 2-naphthalenesulfinate.

37. The method of claim 33, wherein the arylsulfinate salt has an anion that is a benzenesulfinate substituted with an electron withdrawing group selected from halo, cyano, fluoroalkyl, perfluoroalkyl, carboxy, alkoxycarbonyl, aryloxycarbonyl, halocarbonyl, formyl, carbonyl, sulfo, alkoxysulfonyl, aryloxysulfonyl, perfluoroalkylsulfonyl, alkylsulfonyl, azo, alkenyl, alkynyl, dialkylphosphonato, diarylphosphonato, aminocarbonyl, or combinations thereof and the cation is a tetraalkylammonium ion.

38. The method of claim 33, wherein the polymerizable composition comprises 0.1 to 4 wt% electron donor and 0.1 to 4 wt% electron acceptor based on the weight of the ethylenically unsaturated monomer.

39. The method of claim 33, wherein the polymerizable composition further comprises a sensitizing compound and said reacting comprises exposing the polymerizable composition to actinic radiation having a wavelength in the range of 250 to 1000 nanometers.